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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/590,414	04/27/2007	Atsushi Amano	295197US40X PCT	8705
22850 7590 05/20/2010 OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER FLANIGAN, ALLEN J	
			ART UNIT 3744	PAPER NUMBER
			NOTIFICATION DATE 05/20/2010	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/590,414	<b>Applicant(s)</b> AMANO ET AL.	
	<b>Examiner</b> Allen J. Flanigan	<b>Art Unit</b> 3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)    | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 6) <input type="checkbox"/> Other: ____.  |

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-8, 10, and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Banney et al.

Banney et al. teach a cold plate with manifold spaces formed in a pair of joined plates 15, 16 that also enclose a heat exchanger 21 (see Fig. 1). One of the plates defines recesses for the manifolds, and a central recess that receives the heat exchanger. The heat exchanger 21 may take the form of a flat multibore element (Figs. 8, 9, 31) that can be made by extrusion. Soldering is proposed as a method to assemble and seal the components.

Regarding claim 2, the term “brazing” and “soldering” are considered relatively interchangeable, since both involve the fusion bonding of normally metallic components using alloys of a melting point lower than that of the materials being joined.

Regarding claims 3 and 11, the preferred embodiment of Banney et al. provides channels of width W of about 0.4 mm and height H of about 3.6 mm,

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which yields a hydraulic diameter of 0.72 mm approximately (since  $D_H$  for a rectangular channel equals  $2HW/H + W$ ).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Banney et al. in view of Davies et al.

Assuming arguendo that the solder joining process for assembling the heat exchanger and covers of Banney et al. does not fall within the scope of the current claimed “brazed” assembly, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to employ such a well known technique to assemble these components. Davies et al. not only shows that furnace brazing is a known method of assembling cold plate components (see paragraph 28 of Davies et al.), but also expressly recognizes the equivalency of brazing and soldering.

Claims 12-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Banney et al. in view of Lindberg et al.

Banney et al. discuss the use of microchannel cold plate devices in electronic cooling applications (lines 1-41 of column 9 of Banney et al.). Lindberg et al. further show that it is known to employ microchannel liquid

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cooling to cool components in electric vehicles (see Figs. 6-7 of Lindberg et al.). Thus, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to employ the cold plate design of Banney et al. in an electric vehicle application, either with or without the thermoelectric refrigeration device disclosed in Banney et al. Such a modification would involve no more than a mere substitution of the cold plate design of Banney et al. for that of Lindberg et al. See MPEP 2141 III. Regarding claim 13, see the comments made above in regard to claim 2. Regarding claims 17 and 18, note radiator/fan 36 of Lindberg et al.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Banney et al. in view of Lindberg et al. as applied to claim 12 above, and further in view of Davies et al.

See the comments made above in the rejection of claims 2 and 9, which are equally applicable herein.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Parish, IV et al. teach that it is known to provide plural multibore elements in parallel side by side relationship to form a cold plate. The remaining references show various cold plate designs.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen J. Flanigan whose telephone number is (571) 272-4910. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on (571) 272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Allen J. Flanigan/  
Primary Examiner, Art Unit 3744